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ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-9889

EXAMINER	
JACKSON, BLANE J	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/769,445	Applicant(s) GORE ET AL.	
	Examiner Blane J Jackson	Art Unit 2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The Examiner considers that prior art Sandhu et al. also teaches the amended material to the claims. The Applicant argues that Sandhu merely teaches a wireless communication system with an adaptive beam selection feature. However, Sandhu is not teaching an adaptive antenna array (column 1, line 65 to column 2, line 22). An adaptive array has the ability to actively form a beam towards the subscriber while nulling interfering signals. Conversely, Sandhu teaches an enhanced switched beam system (SBS) that uses a beam former to provide a plurality of output ports each comprised of a fixed distinct beam pattern summed from the signals to/from a set of antenna(s) from a plurality of antennas. These patterns are not beam steered. The beam former uses a fixed subset of the antennas, the antennas of an omni directional or directional signal pattern, to combine and provide unique signal beams to the plurality of signal output ports (figure 1). The subsequent switching matrix, under performance related computational control, matches the best beam former output port with the selected RF chain to maximize transceiver performance with the specific active wireless user.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-5, 7, 8, 13, 15, 16 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Sandhu et al. (U.S. Patent 6,438,389).

As to claim 1, Sandhu teaches a method of selecting an optimal set of antennas from a plurality of antennas for use by a transmitter and/ or receiver having a plurality of RF chains to transmit and/or receive a wireless signal on a wireless link, the method (figures 1 and 7, column 4, lines 41-67) including:

determining information concerning transmission of wireless signals on the wireless link (column 5, lines 6-24 and column 6, lines 38-59),

selecting an optimal set of antennas from the plurality of antennas based on the information (figure 1, beam former forms N distinct beams (52) for selection to an individual RF chain, does *not electronically beam steer*, from M plurality of antennas, column 5, line 64 to column 6, line 6),

wherein the optimal set of antennas is a set number or the plurality of antennas (the beam former forms distinct antenna beams where the plurality of antennas may be omni directional or directive, column 5, lines 30-40, column 4, lines 6-10 and lines 50-67, Sandhu teaches a switched beam system (SBS) not beam steering such that a set number of antennas comprise each distinct beam, column 1, line 65 to column 2, line 22),

connecting the RF chains to the optimal set of antennas to permit transmission or reception of the wireless signal on the wireless link via the optimal set of antennas (figures 1 and 5, column 5, lines 24-29 and transmission/ reception: figure 5, column 8, line 15-33) and,

the RF chains correspond in number to the number of antennas in the optimal set of antennas and the number of antennas included in the plurality of antennas is greater than the number of RF chains (RF chain for each distinct beam or optimal set of antennas: figures 5-7, column 5, lines 22-29, M antennas greater than number of RF chains: figure 1, column 4, lines 50-58).

As to claim 2, Sandhu discloses the information is used to optimize the wireless link according to criterion including any one of capacity, diversity, spatial multiplexing and any other criterion for which the wireless link is to be optimized (column 5, lines 6-20 and line 64 to column 6, line 6).

As to claims 3 and 4, Sandhu teaches a wireless base station, a transceiver that also houses a signal quality measurement and control system (figure 7, (24), (30), (44), (46) and (34)).

As to claims 5 and 21, Sandhu teaches a transmitter including:

a plurality of antennas (figure 1, antennas (20),1-M),

a plurality of RF chains, each RF chain transmits a wireless signal on a wireless link to a receiver via one of the plurality of antennas (figures 6 and 7, transmission/ reception: column 8, lines 15-23),

an antenna selection apparatus which selects an optimal set of antennas from the plurality of antennas for use by the RF chains to transmit the wireless signal on the wireless link (column 4 lines 50-66 and column 5, line 64 to column 6, line 6),

where the antenna selection apparatus which selects an optimal set of antennas from the plurality of antennas for use by the RF chains to transmit the wireless signal on the wireless link (figure1, Signal quality measurement device (46), column 5, lines 6-25),

wherein the optimal set of antennas is a set number of the plurality of antennas (figure 1, Beam Former (22) forms set distinct antenna beams where the plurality of antennas may be omni directional or directive, column 5, lines 30-40, column 4, lines 6-10 and lines 50-67, Sandhu teaches a switched beam system (SBS) not beam steering such that a set number of antennas comprise each distinct beam, column 1, line 65 to column 2, line 22),

wherein the antenna selection apparatus determines information concerning transmission of wireless signals on the wireless link, selects an optimal set of antennas form the plurality of antennas based on the information and connects the RF chains to the optimal set of antennas to permit transmission of the wireless signal from the RF chains on the wireless link via the optima set of antennas (figure 1, distinct beams comprised of a set of selected antennas selected for each RF chain, column 5, lines 22-67), and,

the RF chains correspond in number to the set number of antennas in the optimal set of antennas and the number of antennas included in the plurality of antennas is greater than the number of RF chains (N distinct beam channels selected to corresponding switch and RF chain, column 4, lines 50-66).

Sandhu further teaches the RF chains correspond to a number at least equal to a highest possible optimal number of antennas to be determined based on the information (select any optimal number of selector switch and associated RF chain column 7, line 48-64) and the number of antennas included in the plurality of antennas included in the plurality of antennas is greater than the number of RF chains (N beams formed from a plurality of M antennas: column 4, lines 50-60).

As to claim 7, Sandhu discloses the information is used to optimize the wireless link according to criterion including any one of capacity, diversity, spatial multiplexing and any other criterion for which the wireless link is to be optimized (column 5, lines 6-20 and line 64 to column 6, line 6).

As to claim 8, Sandhu teaches a wireless base station, a transceiver that also houses a signal quality measurement and control system (figure 7, (24), (30), (44), (46) and (34)).

As to claim 13, Sandhu teaches a receiver including:

a plurality of antennas, a plurality of receive radio frequency (RF) chains, each receive RF chain receives a wireless signal on a wireless link from a transmitter via one of the plurality of antennas (figures 1, 6 and 7, column 4, line 50 to column 5, line 5),

an antenna selection apparatus which selects an optimal set of antennas from the plurality of antennas for use by the receive RF chains to receive the wireless signal on the wireless link (column 5 lines 21-29),

wherein the optimal set of antennas is a set number or the plurality of antennas (the beam former forms distinct antenna beams where the plurality of antennas may be omni directional or directive, column 5, lines 30-40, column 4, lines 6-10 and lines 50-67, Sandhu teaches a switched beam system (SBS) not beam steering such that a set number of antennas comprise each distinct beam, column 1, line 65 to column 2, line 22),

wherein the antenna selection apparatus determines information concerning receiving of wireless signals on the wireless link, selects an optimal set of antennas form the plurality of antennas based on the information and connects the RF chains to the optimal set of antennas to permit receipt of the wireless signal from the RF chains on the wireless link on the wireless link (figure 1, distinct beams comprised of a set of selected antennas selected for each RF chain, column 5, lines 22-67), and,

the RF chains correspond in number to the set number of antennas in the optimal set of antennas and the number of antennas included in the plurality of antennas is greater than the number of RF chains (figure 1, N beams formed from a plurality of M antennas; column 4, lines 50-66).

As to claim 15, Sandhu discloses the information is used to optimize the wireless link according to criterion including any one of capacity, diversity, spatial multiplexing and any other criterion for which the wireless link is to be optimized (column 5, lines 6-20 and line 64 to column 6, line 6).

As to claim 16, Sandhu teaches a wireless base station, a transceiver that also houses a signal quality measurement and control system (figure 7, (24), (30), (44), (46) and (34)).

As to claim 23, Sandhu discloses the information is used to optimize the wireless link according to criterion including any one of capacity, diversity, spatial multiplexing and any other criterion for which the wireless link is to be optimized (column 5, lines 6-20 and line 64 to column 6, line 6).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 9, 11, 12, 17, 19, 20, 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu with a view to Yun et al. (U.S. Patent 6,600,934).

As to claims 9, 12 and 24, Sandhu teaches a transmitter including:

a plurality of antennas,

a plurality of RF chains, each RF chain transmits a wireless signal on a wireless link to a receiver via one of the plurality of antennas (figures 6 and 7, transmission/ reception: column 8, lines 15-23),

an antenna selection apparatus which selects an optimal set of antennas from the plurality of antennas for use by the RF chains to transmit the wireless signal on the wireless link (column 4 lines 50-66 and column 5, line 64 to column 6, line 6),

where the antenna selection apparatus which selects an optimal set of antennas from the plurality of antennas for use by the RF chains to transmit the wireless signal on the wireless link (figure1, Signal quality measurement device (46), column 5, lines 6-25),

wherein the optimal set of antennas is a set number of the plurality of antennas (figure 1, Beam Former (22) forms set distinct antenna beams where the plurality of antennas may be omni directional or directive, column 5, lines 30-40, column 4, lines 6-10 and lines 50-67, Sandhu teaches a switched beam system (SBS) not beam steering such that a set number of antennas comprise each distinct beam, column 1, line 65 to column 2, line 22),

wherein the antenna selection apparatus determines information concerning transmission of wireless signals on the wireless link, selects an optimal set of antennas form the plurality of antennas based on the information and connects the RF chains to the optimal set of antennas to permit transmission of the wireless signal from the RF chains on the wireless link via the optima set of antennas (figure 1, distinct beams

comprised of a set of selected antennas selected for each RF chain, column 5, lines 22-67), and,

the RF chains correspond in number to the set number of antennas in the optimal set of antennas and the number of antennas included in the plurality of antennas is greater than the number of RF chains (N distinct beam channels selected to corresponding switch and RF chain, column 4, lines 50-66).

Sandhu further teaches the RF chains correspond to a number at least equal to a highest possible optimal number of antennas to be determined based on the information (select any optimal number of selector switch and associated RF chain column 7, line 48-64) and the number of antennas included in the plurality of antennas included in the plurality of antennas is greater than the number of RF chains (N beams formed from a plurality of M antennas: column 4, lines 50-60).

Sandhu does not teach the antenna selection apparatus ***receives*** information concerning transmission of wireless signals on the wireless link and selects an optimal set of antennas from the plurality of antennas based on the information.

Yun teaches a method for a base station to select a transmission antenna (diversity) corresponding to an antenna selection signal message received from a subscriber unit (column 4, lines 2-6 and lines 37-55). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Sandhu with the subscriber supplied signal quality message supplied by the subscriber unit of Yun such that the subscriber unit can directly ascertain the signal quality of a downlink signal for efficient use of forward code resources and transmit power.

As to claims 11 and 26, Sandhu discloses the information is used to optimize the wireless link according to criterion including any one of capacity, diversity, spatial multiplexing and any other criterion for which the wireless link is to be optimized (column 5, lines 6-20 and line 64 to column 6, line 6).

As to claims 17 and 20, Sandhu teaches a receiver including:

a plurality of antennas, a plurality of receive radio frequency (RF) chains, each receive RF chain receives a wireless signal on a wireless link from a transmitter via one of the plurality of antennas (figures 1, 6 and 7, column 4, line 50 to column 5, line 5),

an antenna selection apparatus which selects an optimal set of antennas from the plurality of antennas for use by the receive RF chains to receive the wireless signal on the wireless link (column 5 lines 21-29),

wherein the optimal set of antennas is a set number or the plurality of antennas (the beam former forms distinct antenna beams where the plurality of antennas may be ominidirectional or directive, column 5, lines 30-40, column 4, lines 6-10 and lines 50-67, Sandhu teaches a switched beam system (SBS) not beam steering such that a set number of antennas comprise each distinct beam, column 1, line 65 to column 2, line 22),

wherein the antenna selection apparatus **determines** information concerning receiving of wireless signals on the wireless link, selects an optimal set of antennas form the plurality of antennas based on the information and connects the RF chains to

the optimal set of antennas to permit receipt of the wireless signal from the RF chains on the wireless link on the wireless link (figure 1, distinct beams comprised of a set of selected antennas selected for each RF chain, column 5, lines 22-67), and,

the RF chains correspond in number to the set number of antennas in the optimal set of antennas and the number of antennas included in the plurality of antennas is greater than the number of RF chains (figure 1, N beams formed from a plurality of M antennas: column 4, lines 50-66).

Sandhu does not teach where the antenna selection apparatus ***receives*** information concerning transmission of wireless signals on the wireless link and selects an optimal set of antennas from the plurality of antennas based on the information.

Yun teaches a method for a base station to select a transmission antenna (diversity) corresponding to an antenna selection signal message received from a subscriber unit (column 4, lines 2-6 and lines 37-55). It follows an antenna selected for quality communications in the downlink or uplink would be the most effective antenna for the respective reverse path. This point is also made Sandhu (column 8, lines 15-19). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Sandhu with the subscriber supplied signal quality message supplied by the subscriber unit of Yun such that the subscriber unit can directly ascertain the signal quality of a downlink signal for efficient use of forward code resources and transmit power.

As to claim 19, Sandhu discloses the information is used to optimize the wireless link according to criterion including any one of capacity, diversity, spatial multiplexing and any other criterion for which the wireless link is to be optimized (column 5, lines 6-20 and line 64 to column 6, line 6).

6. Claims 6, 10, 14, 18, 22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu et al. (U.S. Patent 6,438,389) with a view to Krile (U.S. Patent 6,229,486).

As to claims 6, 10, 14, 18, 22 and 25, Sandhu teaches a wireless transceiver station that monitors signal quality to determine the management of a plurality of transmission and receive antennas for best signal quality in communication with a transceiver subscriber unit but does not teach the transceiver subscriber unit includes a plurality of antennas (figure 7, column 1, lines 14-19).

Krile teaches a transceiver subscriber unit with a plurality of antennas with a control system to monitor the signal quality and intelligently select the optimum antenna beam pattern configuration (figure 1, column 3, lines 16-41). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the transceiver subscriber unit of Sandhu with the transceiver subscriber unit of Krile to also select to obtain an optimal antenna configuration for best signal quality.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blane J Jackson whose telephone number is (703) 305-5291. The examiner can normally be reached on Monday through Friday, 8:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (703) 305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BJJ

EDWARD F. URBAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600